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Access to Long-Term Debt and Effects on Firms' Performance

Lessons from Ecuador

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Does the availability of long-term financing affect a firm's productivity (by facilitating access to more productive technologies) and capital accumulation? Or does the less intense monitoring and the lesser fear of liquidation associated with long-term debt actually reduce productivity?

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Summary findings

Recent theory increasingly emphasizes the association of short-term debt with higher-quality firms and better incentives. The possibility of premature liquidation, for example, may serve as a disciplinary device to improve firm performance. At the same time the role of long-term debt, especially when it is heavily subsidized, is being rethought because so many development banks are plagued with nonperforming loans and doubts about the selection criteria used in allocating funds.

Jaramillo and Schiantarelli explore empirical evidence about the structure of debt maturity in Ecuadorean firms. They discuss how it has been affected by government intervention in credit markets, and by financial liberalization. Using firm-level panel data, they investigate the determinants of access to long-term debt in Ecuador. Finally, they provide evidence about how the maturity structure of debt affects firms' performance, particularly productivity and capital accumulation. They find that:

- Long-term debt is very unevenly distributed. Almost 30 percent of firms never have access to it during the period studied.
- Large firms are more likely to have access to long term debt than small firms. The former are on average more profitable.
- Conditional on size, operating profits do not increase the probability of receiving long-term credit and may actually decrease it. This suggests that the mechanism used to allocate long-term resources in Ecuador may be flawed.
- The allocation problem was worse for directed credit. There is some evidenct that, after financial liberalization, the problem was less severe.
- There is a strong positive association between asset maturity and debt maturity, a matching of assets and liabilities.
- Shorter-term loans are not conducive to greater productivity while long-term loans may lead to improvements in productivity.
- While long-term loans may positively affect the quality of capital accumulation, they do not have an impact on the amount of fixed investment.

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ACCESS TO LONG TERM DEBT AND EFFECTS ON FIRMS' PERFORMANCE: LESSONS FROM ECUADOR

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I. INTRODUCTION

The main emphasis in the theoretical and empirical analysis of firm financing has been on the choice of debt versus (internal or external) equity.[1] Although, the idea of debt as an homogeneous source of funds is a powerful theoretical construct and a useful first step, one must go beyond the leverage decision and investigate other dimensions of the debt choice. In particular the nature of debt and its incentive properties can differ according, for instance, to its maturity (long and short) and to the providers (banks or markets).[2]

In this paper we plan to address the issue of the maturity structure of firms' debt and to provide some empirical evidence for Ecuador.[3] Although the issue of the maturity structure of debt is important for both developed and developing countries, there are some aspects of the problem that have been more often (although not exclusively) raised with respect to the latter. In particular, there has been a widespread perception both by domestic and international policy makers that asymmetric information and contract enforcement problems may lead to a shortage of long term finance. This shortage is thought to have a cost in terms of productivity growth and capital accumulation and it may justify some form of government intervention. The setting up in most developing countries of long term credit institutions (development banks) and/or of programs to foster the provision of long term credit was indeed the policy response to this problem.

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[1] See Harris and Raviv (1990) for a comprehensive critical review.

[2] On the maturity choice see Myers (1977), Diamond (1991), Diamond (1993), Kale and Noe (1990), Hart and Moore (1994), and Barclay and Smith (1995). On the role of intermediated debt see Diamond (1984), Calomiris and Kahn (1991), Rajan (1992).

[3] See also Schiantarelli and Sembenelli (1996) for a parallel analysis for the UK and Italy and Schiantarelli and Srivastava (1996) for India.

The emphasis on long-term finance and on the potentially adverse consequences when it is in short supply is somewhat at odds with recent theoretical contributions that emphasize the fact that the use of short term debt may be associated with higher quality firms and may have better incentive properties. In particular, the possibility of premature liquidation may act as a discipline device that improves firms' performance. A re-thinking of the role of long term debt, particularly when heavily subsidized, has also been prompted by the problems encountered in many countries by development banks in terms of non performing loans and by doubts about the selection criteria used in allocating funds.

The purpose of our paper is three fold. First, we plan to document the maturity structure of debt for Ecuadorian firms in the 80's and early 90's. We will also discuss how the maturity structure has been affected by government interventions in credit markets and by the process of financial liberalization that started in the mid 80's. Second, using firm level panel data, we intend to analyze how the access to long term debt is related to various firms' characteristics. Third, we provide some empirical evidence on the impact of the access to long term debt on firms' productivity and on capital accumulation. The empirical work contained in this paper is based both on aggregate financial data and on micro level data (especially the latter). The micro data consists of accounting data for several hundred of firms collected by the Superintendencia de Companias.

Although the empirical analysis we provide constitute a useful preliminary step, it must be clear that the paper does not allow one to answer the ultimate question whether

one ought to subsidize (directly or indirectly) the provision of long term finance and, in the case the answer is yes, which is the best way to do so. The issue is very complex because the consequences of the distortions generated by programs of subsidized or directed credit must be compared to the imperfections in the capital market due to information problems that would exist even in the absence of administrative controls.[4] Moreover, government intervention in promoting the supply of long term resources often has multiple objectives like redressing regional discrepancies or promoting greater equality in income distribution that we do not address at all in this paper. Finally, even if one were to satisfied with the narrower focus we have chosen, the data available to us fall short of giving definitive answers concerning the effects of government supported long term credit. In particular one would optimally need detailed information at the firm level on the amount of long (and short term) credit that is subsidized , together with information of terms and conditions of each loan and on repayment rates by type of program. All this said, the empirical analysis of determinants and consequences of the maturity structure of debt we provide in this paper is a useful first step that highlights some interesting problems and issues in the allocation of long term debt that are relevant for many LDC's.

The structure of the paper is as follows. In Section II we give a macroeconomic overview of the financial developments in Ecuador and on the maturity structure of debt,

[4] See Jaramillo Schiantarelli and Weiss (1993) and (1996) on the relationship between credit allocation and firm characteristics and on the effects of financial constraints on investment pre and post financial liberalization. See also Calomiris and Himmelberg (1995) on subsidized credit in Japan.

using aggregate data. In section III we use two different panel data sets, to provide some evidence on the issue of firms' access to credit and how it relates to firms' characteristics. In Section IV we estimate both a production function and an investment equation to assess the impact of the maturity structure of debt on firms' productivity and capital accumulation. Section V concludes the paper.

II.- MATURITY STRUCTURE AND THE ROLE OF SUBSIDIZED CREDIT

Until the first half of the eighties, the Ecuadorian financial system was characterized by widespread regulations, including interest rate controls, directed credit programs and other government interference in the allocation of finance. As a result, Ecuador exhibited very poor measures of financial depth. For instance, the M2 to GDP ratio was low and even declined from 20% in 1976 to 17% in 1983. One of the most important determinants of the weakness in mobilizing resources through the financial system, was the interest rate policy followed in the 70's and in the early 80's. During this period, interest rates were fixed by the Government at levels at or below the inflation rate. Zero or negative real interest rates discouraged financial savings and limited the ability of banks to mobilize private funds.

However, directed credit programs from public institutions, in particular the Central Bank, compensated the inability of the financial system to generate funds for investment. In 1984, these credit programs represented approximately 50% of the total credit in the economy. This explains why, despite the situation of financial repression,

total credit in the economy increased during the 70's and early 80's, and peaked in 1983, when total credit reached 23% of GDP (see Figure 1 and the first two columns of Table 1, reporting credit as a percentage of GDP and real credit growth rates).

Beginning in 1984, Ecuador introduced a set of reforms that gradually liberalized the financial market. These reforms eliminated or scaled down directed credit programs and removed administrative controls on interest rates. These reforms lead to an increase in real interest rates and improved the ability of the financial system to mobilize resources (see Figure 2). As a result the M2 to GDP ratio increased from 17% in 1983 to 23% in 1987, mainly due to the introduction of the "polizas de acumulation". However, the supply of credit was drastically reduced due to the contraction of government provided loanable funds. As Figure 1 shows, total credit in the economy decreased steadily during the second half of the eighties and was as low as 9% of GDP in 1990. The main explanation for this behavior was the reduction of directed credit programs from public sector institutions that decreased their share in total credit from 52.7% in 1984 to 9% in 1992, as we can see in Table 2. In 1988 also the process of financial deepening suffered a setback, reflected in a fall of the M2 to GDP ratio, followed however by a continuation of the earlier improvements in the 90's.

If one looks at the term structure of debt (see Table 1, the last five columns), long term debt is quantitatively much less important than short term debt. In the early 80's, in the aggregate long term credit (with maturity greater than a year) accounted for 12% of total debt. During the second half of the eighties, its share of total debt increased to 17%

in 1989, but dropped to 8% in 1992. Real growth rate of long term credit was negative for most years, although short term debt declined even faster.

It is difficult to asses exactly the role of directed credit programs on the availability of long term credit. However, most programs of the Corporación Financiera Nacional (CFN) and Banco Nacional de Fomento (BNF), supported sectors and activities like exports (FOPEX), small industry (FOPINAR) and agriculture, with long term lines of credit for the purchase of machinery and fixed assets. The programs financed by rediscount lines that commercial banks could use with the Central Bank, were instead typically short term, although it was a common practice to renew credit lines extended to firms. The programs financed directly by the Central Bank were very important in the first half of the 80's (89% of total directed credit) and decreased in importance throughout the 80's and early 90's (they were 32% of total directed credit in 1992) (see Table 4). In the last two lines of Table 3 we report the proportion of directed long term credit relative to total long term credit and the proportion of directed short term credit relative to total short term credit. The data confirm that the percentage of directed credit is much higher for longer maturities. This percentage decreases from 59.3% in 1985 to 35.9% in 1990. It then increases to 63.4% and 78.7% in the following two years, in spite of the real decline in directed long term credit, since market provided long term credit declines even faster. The percentage of directed short term credit decreases from 31.1% in 1985 to 3.3% in 1992. Remember than in the last two years real total short term credit expanded, following the real credit crunch at the end of the 80's.

We have already mentioned that at the beginning of the 80's real (ex post) "market" lending rates were negative, even in the absence of subsidies. They became positive, on average, until 1987, and negative again in the following two years, following the earthquake and a period of fiscal laxity, resulting in a fall in the M2 to GDP ratio. In the 1990's real rates have been mostly positive and increasing (see Figure 2). Interest on directed credit programs like FOPEX and others administered by CFN were significantly lower than lending market rates, as Table 4 shows. Market rates were 1.58 times the subsidized ones in 1983, 1.94 times in 1988 and only 1.19 times in 1991. The spread between the two was 21.57 percentage points in 1988 and 8.82 percentage points in 1991.

III.- FIRM LEVEL EVIDENCE ON ACCESS TO LONG TERM DEBT AND ON DEBT MATURITY

In this section we will discuss the micro level evidence on the maturity structure of firms' financing. We use two samples in our analysis.[5] Both of them are based on accounting data collected by the Superintendencia de Companias. The first (unbalanced) sample (SC1 from now on) includes 731 Ecuadorian manufacturing companies during the period 1984-1988 and contains more detailed information on firms' real and financial variables. Moreover, for the companies in this sample we have been able identify whether they belong or not to an industrial group with bank association. For this sample we have available separate figures for short term (non trade) debt, long term debt, and trade debt,

[5] See the Data Appendix for a description of the data.

so that our measure of length of maturity equals long term debt divided by the sum of long term debt, short term debt and trade debt.

The second sample, that unfortunately cannot be linked to the first one, is also derived from the data of the Superintendencia de Companias, includes 850 companies and covers the period 1984-1992 (SC2 from now on). The period covered by this sample is longer and more recent so that it allows us to investigate more convincingly changes in the allocation mechanism of long term credit, before and after financial liberalization. This data set, however, contains fewer and much more aggregate variables. In this case we only have available data on total long term liabilities (that includes also debt of shareholders -quite important in smaller companies- and other deferred liabilities unrelated to financial or trade debt). In this case our measure of length of maturity is total long term liabilities divided by total liabilities.

III.1. DESCRIPTIVE STATISTICS FOR THE TWO PANELS

For the firms in the SC1 sample, long term financial debt represented in 1984 11.5% of total debt (see Table 5). This figure is of the same order of magnitude as the one obtained from aggregate financial data. The share of long term debt in total debt increased until 1987, reflecting the faster decline in short term debt during that period. In the SC2 sample, we observe after 1987 a decrease in the length of maturity, as a result of the real decline in long term debt and of the real expansion in short term debt we have already observed at the aggregate level.

One striking facts concerning the maturity structure of financing is that there is a large number of firms that appear to be cut-off altogether from any access to long term debt. In the SC1 sample, which is the one to be used to draw inferences about access given the more detailed figures on debt, 214 firms (29.3% of the total) never received long term financial credit, 311 firms (42.5% of the total) had long term debt during some years, while only 211 firms (28.2% of the total) always had long term debt (see Table 6, Part I). In the SC2 sample, which, because of the more aggregate nature of the debt variables is bound to present a rosier picture, 25 firms (2.9% of the total) never had long term liabilities, 538 firms (63.3%) had long term liabilities during some years, and 287 (33.8% of the total) had it during the whole period.

It is interesting to note that according to the SC1 sample, access to long term financing improves over time (see Table 6, Part II). In 1984, only 37% of firms had long term debt. This number increases to 59.2% in 1987 and decreases slightly to 58.9% in 1988. Unfortunately, we cannot track the question of access in the more recent years because the SC2 sample is less informative in this sense.

If we split the SC1 sample by size, we can see that access to long term credit varies positively with size (see Table 7, Part I). Among the largest group of companies, 58% had long term debt in every year of the period. Conversely, only 11% of the micro firms and 17% of the small firms had similar access to long term financing. Half of the micro firms and 44% of the small firms never had long term debt, while only 1.9% of large firms never had long term debt. Similar conclusions concerning the correlation between access to long term debt and size are derived from sample SC2.

Access to long term credit also has a positive (simple) correlation with age: older firms have better access to this type of financing than younger firms, as we can see in Table 7, Part II. For instance 35.7% of the youngest firms have never received long term debt, while the figure is 22.7% for the oldest firms.

We have also explored the relationship between access to long term credit and bank association[6]. Almost half of the firms that have an association with banks, had long term loans during the whole period. In contrast, only 25% of the firms with no bank association had regular access to long term financing (see Table 7, Part III). It is important to mention that older firms and companies with bank association are usually the larger ones.

Finally, in Tables 8 we investigate the association between the maturity structure of liabilities and other firms' characteristics, for the SC1 and the SC2 sample respectively. In the first three columns of the table we continue to partition firms between those who never, sometimes, always had access to long term debt. In the last three columns we partition the firm-year observations according to whether maturity is below the median, between the median and the third quartile, and above the third quartile. Obviously, the share of long term credit to total credit is higher in companies that always had long term financing compared to the rest. Firms that always had long term debt, are larger, judging by their mean or median real capital stock or real sales, more leveraged, with a higher proportion of fixed assets to total assets, more profitable and more dynamic, judging by the real sales growth rate. However, the investment rate (the ratio of

[6] Bank association was defined whenever management or important shareholders of manufacturing firms were also members of the Board of Directors of a financial institution.

investment to the capital stock) is lower for this group of firms. The ratio of liquid assets to total capital is no different for firms that never had access to long term credit and those that always had it, although it is higher for companies that have had long term financing during some years. The results obtained when firms are partitioned according to quartiles are similar with two interesting exceptions. Firstly, the (operating) profit rate is the lowest for the group with a maturity length in the top quartile relative to the other firms. Secondly, the liquid asset to total asset ratio seems to be monotonically decreasing with maturity. The results for the SC1 and the SC2 sample are very similar. The only difference is that profit is always positively correlated both to the access and length of maturity.

III.2. ECONOMETRIC EVIDENCE ON ACCESS AND MATURITY

We now discuss some of the econometric evidence on the access to long term debt. In Table 9 we report in the first two columns the results obtained using probit and logit models for the probability of obtaining long term credit for the SC1 sample. In order to take into account of the panel data nature of the data, in the last two columns we also report the results for the probit random effects model (see Butler and Moffit (1982)) and for the fixed effect logit model (see Chamberlain (1980)). In order to minimize endogeneity problems, at least in the logit models with fixed effects, we have included all regressors as beginning of period (if stocks) or last period values (if flows). All equations in this subsection include also sector and year dummies (not reported here for brevity

sake), with the exception of the logit model with fixed effects which includes only year dummies. Although the significance of the coefficient varies across estimators, the direction of the effects of the various variables is in most cases consistent across estimators. One of the clearest results is that size (proxied here by the logarithm of the real capital stock at the beginning of the period, LRKAP1) is very important in determining access to long term credit. More specifically, the probability in obtaining long term credit is greater for larger firms. This result is consistent with one of the prediction in the model by Diamond (1991) that shows that for firms with low credit rating (presumably the small ones in our case), an increase in quality is associated with gaining access to long term debt.[7] In his model the basic trade off is between the benefit of short term debt, because it allows firms to take advantage of favorable news certain, and the liquidation risk they have to bear, since opportunistic lenders may try to appropriate the surplus by forcing the firm into bankruptcy. However, great caution is needed before linking the empirical results for Ecuador to the theoretical models that have been proposed in the literature. One problem is that lenders are assumed to be profit maximizing in the model, which may or may not be an accurate assumption for Ecuadorian intermediaries in their role of providers of directed credit.

Since we have used the real value of fixed assets as a proxy for size, the positive effect of size also reflects the fact that the availability of collateral is a prerequisite to obtain long term debt. Finally, the positive effect of the size variable could capture the

[7] See Schiantarelli and Sembenelli (1996) for a more detailed discussion of the theoretical models of maturity choice.

greater economic and political bargaining power by large firms in obtaining long term directed credit.

Apart (nearly) from size, no other firm characteristic has a statistically significant coefficient at conventional levels in the fixed effect logit equation, although the direction of the effects are identical to those in the other models. The lack of precision in the coefficient estimates in the fixed effect logit model, should not be too surprising since estimation of the conditional likelihood function implies a loss of efficiency since many observations drop out from the (conditional) likelihood (see Chamberlain (1980) for details).

Given size, past operating profits as a proportion of total assets (fixed capital plus inventories plus liquid assets), CFK1, does not have a statistically significant effect on the access to long term debt in any equation (actually the point estimate is always negative). One has to remember that the larger firms in the panel are more profitable than smaller ones. However, it is somewhat worrisome from the point of view of the allocation of directed credit that, conditional on size, profits do not matter, in determining access to long term credit.

The association with a business group with bank links, captured by the dummy variable BAND, is not a significant determinant of access either. This is somewhat surprising, since members of business groups may be thought to have superior clout in accessing financial resources, in addition to being informationally less disadvantaged. Similarly, everything else equal, the age of the firm (summarized by the AGE2 through to AGE4 dummies in deviation from the youngest firms) is not a

significant determinant of access. The explanation for both these results may be that the effect of bank association or age is basically subsumed by the size variable, given the high probability that larger firms are group members and, at the same time, older.

The overall past degree of leverage, LEV1, is positively related to access to long term debt. Past access to both short term and long term debt may work here as a predictor of the ability to obtain long term debt (more on the role of leverage below). The initial stock of liquid assets, LASK1, does not play, instead, a statistically significant role.

In Table 10 we report the results for the SC1 sample from estimating a sample selection model for the length of debt maturity, using standard two steps procedures. The dependent variable is long term debt as a proportion of total debt, including trade debt, MAT. We report the results obtained when either a probit model or a logit model is used in the first step. The coefficient of cash flow in the maturity equation is negative, which emphasizes the worries we have already express concerning criteria for the allocation of long term directed credit in Ecuador. Paralleling the results for the access, the length of maturity is positively and significantly related to lagged leverage. As we have already explained, this latter result may reflect the fact that having obtained debt in the past is an indication of the ability to obtain long term debt in the future. It is also consistent with the idea that higher leverage increases the risk of liquidation and makes long term debt more attractive for firms. The length of maturity is also positively associated with size, but the association is not very significant.

There also evidence of a very strong and positive association between lagged asset maturity (proxied here by the ratio between fixed capital and the sum of fixed capital

(estimated) inventories and liquid assets, ASS1. This is consistent with the idea that firms tend to match the maturity structure of assets and liabilities, as implied by the conventional wisdom and as predicted by the more formal model by Hart and More (1994). It is also consistent with the hypothesis that fixed assets may be a better form of collateral for long term debt, so that their availability is associated with longer maturity of debt. Finally the growth of real sales, GYREAL1, has a positive but not significant effect on maturity.

One important issue that deserves to be investigated is whether changes have occurred over time in the determinants of access to long term credit and, conditional on having access, on the maturity structure of debt. In particular, we would like to know whether financial liberalization has introduced any change in the allocation mechanism of long term debt. We have used the longer SC2 sample to obtain some evidence on this issue.[8] In Table 11 we have reported the results obtained estimating the sample selection model for the SC1 sample. After some experimentation, we have allowed the coefficients on lagged operating profits as a proportion of total assets (PROF1) and on the lagged value of the logarithm of real assets (LRTA1) to vary before and after liberalization , both in the access and maturity equation (in Table 12 LD is a dummy variable that equals one from 1989 onward).[9] The results suggest that the probability of having access to long term debt before financial liberalization is positively related to size and leverage and negatively related to profits. These results are similar to those obtained for the SC1

[8] In order to investigate the effect of financial liberalization, it would have been desirable to be able to link the two samples in order to cover a longer data period, both pre and post liberalization. As we have already explained this is not possible.

[9] Although financial liberalization started in 1984, it has been a process and it has included set backs. We have also experimented with different breaking points, obtaining similar results.

sample. The main difference is that the profit variable is now negative and significant (it was not significant for the SC1 sample), making even stronger the concerns on the criteria used to allocate long term directed credit. The coefficient on profits incrases significantly after liberalization, but it remains negative. The increase in the value of the coefficient may reflect the fact that financial intermediaries start paying more attention at accounting measures of firms' credit rating after financial liberalization. This would also be confirmed by the fact that the (positive) coefficient of the log of total real assets is significantly and substantially larger after financial reform, which is consistent with a greater importance of collateral. The negativity of the coefficient also in the post reform period could be explained by the fact that better (more profitable) firms prefer to use short term credit, in order to take advantage of future revelation of positive information, as suggested by Diamond (1991) for the firms at the upper end of the quality spectrum. However, there is also another possible explanation for this result. As we have already pointed out, although the real supply of long term directed credit continues to decrease in 1991 and 1992, market provided long term credit shrinks even faster. As a result the share of directed credit out of total long term credit provided to firm increases, and it is possible that the allocation of this portion of long term credit is still problematic also in the more recent years.

The sign and magnitude of the profit coefficients in the second stage maturity equation parallels the ones in the probit equation and, therefore, we will not repeat the arguments we have just gone through. Size does not play a significant role in the

maturity equation, while the maturity composition of assets and the degree of leverage both have a significantly positive effect on the length of the maturity structure of debt.

IV. MATURITY AND PERFORMANCE

In this section we discuss the effect of the maturity structure of debt on firms' performance. More specifically we address two main issues. The first one is whether the availability of long term finance allows firms to improve their productivity. The second one is whether it stimulates capital accumulation by firms. There are at least two reasons why access to long term debt may improve firms' productivity. On the one hand it may allow firms access to better and more productive technologies, which the firm may be reluctant in financing with short term debt because of fears of liquidation. On the other, lack of availability of long term finance may put a squeeze on working capital and this may have adverse consequences on productivity. The other side of the coin is that short term debt, if it carries with it more continuous monitoring, may force firms to reduce inefficiencies and to increase productivity, at each level of measurable inputs (capital stock, number of workers, materials). Ultimately the issue is an empirical one.

In Table 12 we estimate a standard Cobb Douglas production function, with capital, labor and materials, for the SC1 sample, the only one for which the necessary data are available. The logarithm of the real value of sales, LRY, is used as a proxy for output. LRN denotes the log of employment, LRK the log of the real value of fixed assets, and LRM the real value of material used in production. In addition we allow total

factor productivity to depend upon the maturity structure of debt and also on the overall degree of leverage. One potential reason for the inclusion of leverage is that financial pressure may force the firm and its managers to be more efficient.[10] However, it is possible that with more leveraging, controlling shareholders may have a smaller incentive to strive for efficiency, since they reap a smaller fraction of the rewards. We estimate different specifications of the equations in terms of its dynamic structure. All equations are estimated by GMM after taking first differences (see Arellano and Bond (1992).[11] The first difference transformation removes the firm specific and time invariant components of the error term. Removal of the firm specific component of the error term is important in order to avoid the coefficient of maturity simply capturing the fact that better firms may simply receive more long term debt. Lagged values (two or more periods) of the regressors and of the dependent variable are used as instruments to account for potential endogeneity of the regressors, either because the variables are decided jointly with production or because there are measurement errors. All equations contain also year dummies. In the table we also report the test of over-identifying restrictions (denoted here as the Sargan test), distributed as chi-squared, and tests for first and second order serial correlation (m1 and m2 respectively), distributed as a standardized normal.

The results suggest that when beginning of period maturity together with beginning of period leverage is added to the static version of the production function, there is no statistically significant effect on productivity. When maturity and leverage are entered as end of period variables, the effect of maturity is positive and almost

[10] See also Nickell and Nicolitsas (1995) for an analysis using UK panel data.
[11] The DPD program by Arellano and Bond (1988) is used for estimation.

significant, while the leverage effect is virtually zero. When the leverage variable is excluded from the equation, the effect of maturity becomes significant. Still the test of overidentifying restrictions of all the specifications we have illustrated so far suggests that there is some form of mispecification. We have explored one such form of mispecification, namely dynamic mispecification. We have therefore re-estimated the production function including the lagged value of the dependent variable and contemporaneous and lagged values of all the regressors (financial and real). This model can be interpreted as the unrestricted version of a model in which the dynamics is generated by an autoregressive error term of order one. The results are reported in the last column of the table. Now the equation passes the test of overidentifying restrictions. Again we get the result that contemporaneous maturity has a positive effect on productivity, while the leverage effects are insignificant.

What is the impact of the maturity structure of debt and fixed capital accumulation? We investigate this issue by estimating an augmented accelerator type of investment function, where the investment rate, IK, is a function of its own lagged value, of the contemporaneous and once lagged rate of growth in real sales, GYR, past cash flow (net of interest rate payments), CFKN, leverage, LEV, and maturity, MAT. All the coefficients have been allowed to differ across small and large firms (S denotes small and L large in the variables' definition).[12] The results, obtained using the GMM estimator, are reported in Table 13. As one would expect if capital market imperfections are more important for smaller firms than for larger firms, the coefficient is greater and more

[12] Firms are classified as large if their fixed capital stock exceeds 6000.000 dollars at 1975 prices.

significant for the former. The other financial variables, leverage and maturity, do not appear to play an important role, and are not significant at conventional levels, whether they are included contemporaneously or once lagged. When their contemporaneous values are used as regressors, there is some weak evidence of a positive association between maturity and investment, but only for large firms (t = 1.58), while for small firms the association is actually negative (with a t = -1.73).

V. CONCLUSIONS

What have we learned from the empirical analysis of the maturity structure of debt in Ecuador? The most striking fact we have discovered is the very unequal distribution of the maturity structure of debt. This is summarized by the fact that, at one end of the spectrum, almost 30% of all firms never have access to long term credit during the period covered by our richer panel. At the other end of the spectrum, almost 30% of all firms always have some long term debt among their liabilities. The main determinant of the probability of obtaining long term credit is a firm's size (proxied by the real value of the fixed assets). This positive association is consistent with several explanations. One is simply that the availability of collateral is a prerequisite to obtain long term credit. Moreover, since larger firms in Ecuador tend to be more profitable, this result could also reflect the positive association between firm quality and access to long term credit. Finally, larger firms are likely to have better bargaining power and greater political influence in obtaining long term financial resources.

One disturbing additional result is that, conditional on size, operating profits either do not increase the probability of receiving long term credit or may actually decrease it. Moreover, conditional on having obtained access, they are negatively correlated with the length of the maturity structure of debt. This raises some questions on the mechanism used in allocating long term financial resources in Ecuador.

It is interesting that the negative effect of profits is greater before financial liberalization, suggesting that the allocation problem was particularly severe for directed credit. After financial liberalization, the coefficient on profit increases, but not quite enough to make it positive. The increase is consistent with the presence of greater incentives for banks to pay more attention at accounting measures of firms' credit rating.. This would also be confirmed by the fact that the (positive) coefficient of the log of total real assets is significantly and substantially larger after financial reform, which is consistent with a greater importance of collateral. The negativity of the coefficient also in the post reform period could be explained by the fact that better (more profitable) firms prefer to use short term credit. Alternatively, it could be due to the fact that allocation problems still remain for long term directed credit, which, in spite of its real contraction, has increased as a share of total long term credit in 91 and 92, due to the even faster real decrease in the supply of market provided credit.

The data also suggest that there is a strong positive association between asset maturity and debt maturity. This matching of assets and liabilities confirms both the conventional wisdom and the theoretical models that can be used to rationalize it.

Does the availability of long term finance make a difference to a firm's performance, either in terms of productivity or of capital accumulation? With respect to productivity, does long term credit facilitate the access to more productive technologies or does the less intense monitoring and the lesser fear of liquidation associated with long term debt actually reduce productivity? The results obtained from estimating an augmented production function are quite unequivocal in suggesting that a shorter maturity is not conducive to greater productivity. Moreover there is some evidence that long term debt may actually lead to productivity improvements. Although these results suggest that long term debt may have a positive impact on the quality of capital accumulation, estimation of an investment equation does not show a large and significant impact of the maturity structure of debt on the amount of fixed investment.

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DATA APPENDIX

The empirical research is based on information collected by the "Superintendencia de Compañías"(SC) of Ecuador. The SC is a government agency that controls corporate activities. By law, all firms have to submit balance sheet and profit and losses information to the SC in order to do business in Ecuador and in order to obtain credit (official loans, as well as regular credit), tax identification numbers, and other legal requirements.

The balance sheets also include, together with the standard items, information on reevaluations of assets allowed by the Government to account for inflation and exchange rate depreciation. The capital stock measure is the revalued one and it includes plant and machinery, buildings and others (excluding land).

We use two samples in the analysis. Both of them are based on data accounting collected by the SC.

The first (unbalanced) sample (SC1) includes 731 Ecuadorian manufacturing companies during the period 1984 - 1988, out of which 366 firms have data for the full five year period. It contains detailed information on firms' real and financial variables. All the variables used in the paper are the ones derived from the balance sheets or profit and loss account. The only exception is the figure for the stock of inventories that has been computed by multiplying the firm level sale figure by the industry wide inventory to sales ratio in each year.

The second sample (SC2), after eliminating firms with missing, unacceptable, or inconsistent data, or firms not engaged in production activities, consists of 850 firms with complete information available the period 1982-1992. Even though this sample is longer and more recent, it contains more aggregate and therefore fewer variables.

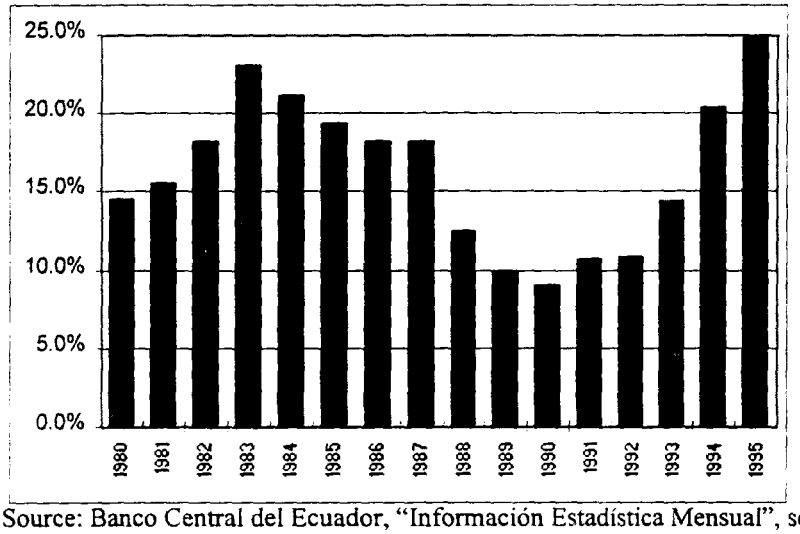
The following table summarizes the structure of the sample.

Category	SC1 sample Frequency	Percent	Cum. Freq.	Cum. Per.	SC2 sample Frequency	Percent	Cum.. Freq.	Cum. Per.
By Size								
Micro	28	3.83%	28	3.83%	212	24.94%	212	24.94%
Small	216	29.55%	244	33.38%	213	25.06%	425	50.00%
Medium	355	48.56%	599	81.94%	213	25.06%	638	75.06%
Large	132	18.06%	731	100.00 %	212	24.94%	850	100.00 %
By Age								
Youngest	171	23.39%	171	23.39%	282	33.18%	282	33.18%
Young	260	35.57%	431	58.96%	456	53.65%	738	86.82%
Old	150	20.52%	581	79.48%	92	10.82%	830	97.65%
Oldest	150	20.52%	731	100.00 %	20	2.35%	850	100.00 %
By Sector								
31: Food and Beverages	143	19.60%	143	19.60%	189	22.20%	189	22.20%
32: Textiles	111	15.18%	254	34.78%	132	15.50%	320	37.70%
33: Lumber	45	6.10%	299	40.88%	41	4.80%	361	42.50%
34: Paper and printing	73	9.99%	372	50.87%	78	9.20%	439	51.70%
35: Chemicals	139	19.02%	511	69.89%	170	20.00%	609	71.70%
36: Metallic minerals	43	5.88%	554	75.77%	49	5.80%	659	77.50%
37: Nonmetallic minerals	19	2.60%	573	78.37%	23	2.70%	682	80.20%
38: Machinery	144	19.70%	717	98.07%	145	17.00%	826	97.20%
39: Others	14	1.92%	731	99.98%	24	2.80%	850	100.00 %

Notes for SC1: Definition of size by capital stock in the initial year: Micro US$ 2000 < K; Small: US$ 2000 < K < US$ 40000; Medium: US$ 40000< K < US$ 600000; Large K > US$ 600000. K : machinery, plant and equipment, other (excluding land); K is valued at 1975 US Dollars. Definition of age: youngest: born after 1980; young: born between 1970 and 1980; old born between 1960 and 1970; oldest: born before 1960.

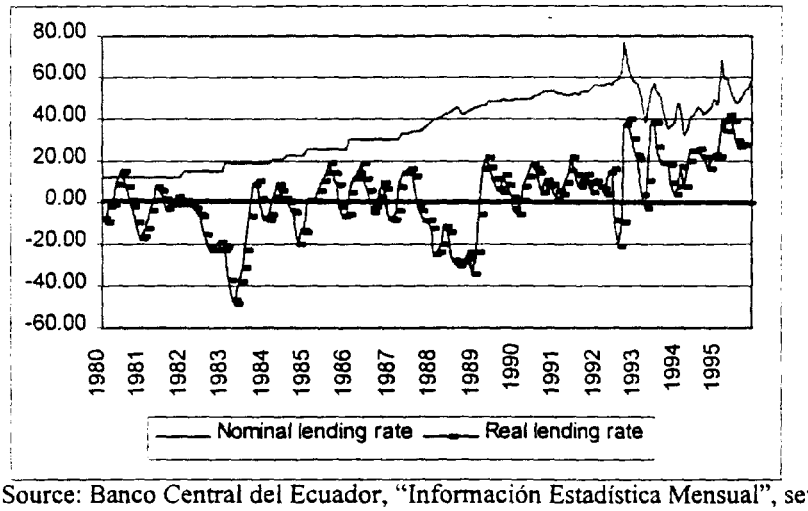
Notes for SC2: Definition of Size in initial year: Micro if real value of total assets < Sucres 2478 ; Small if Sucres 2478 < Real value of total assets < Sucres 9022; Medium if Sucres 9022 < real value of total assets< Sucres 32868; large if real value of total assets > Sucres 32868. All values at 1982 prices.
Definition of age: youngest 15 years old, young born between 15 and 30 years of age; old born between 30 and 50 years of age; oldest: more than 50 years of age.

Graph 1
TOTAL DEBT/GDP



Source: Banco Central del Ecuador, "Información Estadística Mensual", several issues

Graph 2
NOMINAL AND REAL LENDING RATES



Source: Banco Central del Ecuador, "Información Estadística Mensual", several issues

Table 1
EVOLUTION OF AGGREGATE DEBT

Year	Total debt		Short term (< 1 year)		Long term (> 1 year)		Long term debt
	% of GDP	Growth rate (real)	% of GDP	Growth rate (real)	% of GDP	Growth rate (real)	Total debt
1980	14.6%	-	na	-	na	-	na
1981	15.5%	10.7%	na	na	na	na	na
1982	18.2%	18.7%	na	na	na	na	na
1983	23.1%	23.4%	na	na	na	na	na
1984	21.2%	-4.4%	18.5%	na	2.7%	na	12.6%
1985	19.4%	-4.7%	16.6%	-6.3%	2.8%	6.9%	14.4%
1986	18.3%	-2.9%	16.1%	-0.3%	2.2%	-18.9%	12.1%
1987	18.2%	-6.0%	15.8%	-7.0%	2.4%	1.8%	13.3%
1988	12.5%	-24.3%	10.5%	-26.2%	2.0%	-11.2%	16.0%
1989	10.0%	-20.0%	8.2%	-22.5%	1.7%	-5.4%	17.2%
1990	9.1%	-5.9%	7.6%	-5.3%	1.5%	-8.5%	16.8%
1991	10.7%	22.9%	9.7%	33.8%	1.0%	-31.1%	9.4%
1992	10.9%	5.8%	10.0%	7.5%	0.9%	-10.8%	7.9%
1993	14.4%	35.0%	na	na	na	na	na
1994	20.4%	47.1%	na	na	na	na	na
1995	25.0%	25.9%	na	na	na	na	na

Source: Banco Central del Ecuador. "Información Estadística Mensual", several issues;
Superintendencia de Bancos, "Memorias", several issues.

Table 2
DIRECTED CREDIT PROGRAMS
(aggregate figures)

ear	Directed credit programs/Total credit	Directed credit programs (real growth rates)
984	52.7%	
985	35.2%	-37.1%
986	29.0%	-15.0%
987	21.4%	-26.3%
988	27.7%	22.6%
989	17.9%	-41.4%
990	16.1%	-15.4%
991	12.5%	-8.3%
992	9.2%	-26.8%

Source: Superintendencia de Bancos, "Memorias", several issues.

Table 3
DIRECTED CREDIT PROGRAMS
(by type of program)

	1984	1985	1986	1987	1988	1989	1990	1991	1992
CFN		5,932	11,223	18,236	17,349	30,772	37,089	56,212	81,031
Agriculture.	na	764	1,218	2,424	2,940	5,735	3,960	10,423	9,529
Manufacture	na	5,036	9,102	14,907	13,541	24,610	32,720	43,028	66,590
Construction	na		20	24					
Commerce	na	109	546	642	646	283	283	733	4,317
Transport.	na	23	195	85		35	35	1,727	109
Financial	na					43	43	52	3
Services	na		82	154	222	67	50	125	110
Others	na		61					124	374
BNF	22,971	37,376	42,854	47,549	59,280	87,279	132,546	226,238	366,345
Agriculture	16,061	25,882	32,595	31,456	39,172	59,106	96,732	159,702	261,848
Small industry.	2,641	3,704	3,376	5,880	6,250	9,440	12,731	19,506	28,448
Fishery	599	523	611	1,286	1,303	3,196	2,831	7,241	10,261
Transportation	1,670	4,048	1,216	1,321	1,876	2,275	2,358	4,232	8,388
Tourism	98	323	249	312	242	418	476	1,110	1,176
Commerce	1,902	2,897	4,808	7,294	10,440	12,845	17,418	34,447	56,224
Central Bank	194,304	135,583	129,629	121,032	194,221	230,723	284,326	311,840	215,723
Total	217,276	178,890	183,706	186,817	270,850	348,774	453,961	594,290	663,098
% of CFN	n.a	3.3%	6.1%	9.8%	6.4%	8.8%	8.2%	9.5%	12.2%
% of BNF	10.6%	20.9%	23.3%	25.5%	21.9%	25.0%	29.2%	38.1%	55.2%
% of BCE	89.4%	75.8%	70.6%	64.8%	71.7%	66.2%	62.6%	52.5%	32.5%
(BNF+CFN)		59.3%	70.8%	56.7%	38.0%	35.0%	35.9%	63.4%	78.7%
long term credit / short term credit		31.1%	23.3%	16.0%	18.4%	14.3%	12.1%	7.3%	3.3%

Source: Superintendencia de Bancos, "Memorias", several issues.

Table 4
INTEREST RATES ON DIRECTED CREDIT PROGRAMS AND MARKET RATES

	(1) FOPEX and other CFN credit programs	(2) Lending market rates	Size of the subsidy (2)/(1)
1983	12	19	1.58
1984	18	23	1.28
1985	18	25.6	1.42
1986	18	30.7	1.71
1987	23	38.79	1.69
1988	23	44.57	1.94
1989	32	49.16	1.54
1990	39	53.09	1.36
1991	47	55.82	1.19

Source: Banco Central del Ecuador, "Información Estadística Mensual", several issues.

Table 5
LONG TERM DEBT/TOTAL DEBT

	Aggregate data	SC1 Sample (*)	SC2 Sample (**)
1984	12.6%	11.5%	27%
1985	14.4%	13.8%	27%
1986	12.1%	17.7%	28%
1987	13.3%	19.1%	28%
1988	16.0%	17.0%	27%
1989	17.2%	na	25%
1990	16.8%	na	25%
1991	9.4%	na	25%
1992	7.9%	na	20%

(*) $\frac{\text{Long term credit}}{\text{Long term + short term + trade debt}}$ (**) $\frac{\text{Long term liabilities}}{\text{Total liabilities}}$

Table 6
ACCESS TO LONG TERM DEBT

PART I: over the entire period				
	SC1 sample		SC2 sample	
	No. of firms	%	No. of firms	%
Never	214	29.3%	25	2.9%
Some	311	42.5%	538	63.3%
Always	206	28.2%	287	33.8%
Total	731	100%	850	100%
PART II: firms with positive long term debt, by year				
	SC1 sample		SC2 sample	
	No. of observations	% of total observations	No. of observations	% of total observations
1984	171	37.1%	623	73.3%
1985	226	42.5%	617	72.6%
1986	307	56.0%	649	76.4%
1987	381	59.2%	658	77.4%
1988	362	58.9%	657	77.3%
1989	na	na	649	76.4%
1990	na	na	668	78.6%
1991	na	na	654	76.9%
1992	na	na	584	68.7%
Total	1447	51.7%	6996	74.8%

Source: see data appendix

Table 7
ACCESS TO LONG TERM DEBT

PART I: by size				
	SC1 sample		SC2 sample	
	No. of firms	%	No. of firms	%
Smallest	28	100%	212	100%
Never	14	50%	16	7.5%
Some	11	39.3%	161	75.9%
Always	3	10.7%	35	16.5%
Small	216	100%	213	100%
Never	94	43.5%	5	2.3%
Some	86	39.8%	157	73.7%
Always	36	16.7%	51	23.9%
Large	355	100%	213	100%
Never	94	26.5%	4	1.9%
Some	165	46.5%	133	62.4%
Always	96	27%	71	35.7%
Largest	132	100%	212	100%
Never	12	9.1%	0	0%
Some	49	37.1%	87	41%
Always	71	53.8%	125	59%
PART II: by age				
	SC1 sample		SC2 sample	
	No. of firms	%	No. of firms	%
Youngest	171	100%	282	100%
Never	61	35.7%	9	3.2%
Some	66	38.6%	194	68.8%
Always	44	25.7%	79	28.0%
Young	260	100%	456	100%
Never	82	31.5%	14	3.1%
Some	112	43.1%	285	62.5%
Always	66	25.4%	157	34.4%
Old	150	100%	92	100%
Never	34	22.7%	2	2.2%
Some	69	46.0%	47	51.1%
Always	47	31.3%	43	46.7%
Oldest	150	100%	20	100%
Never	37	24.7%	0	0%
Some	64	42.7%	12	60%
Always	49	32.6%	8	40%
PART III: by bank association				
	SC1 sample		SC2 sample	
	No. of firms	%	No. of firms	%
Not associated	606	100%	na	na
Never	184	30.4%	na	na
Some	268	44.2%	na	na
Always	154	25.4%	na	na
Associated	109	100%	na	na
Never	19	17.4%	na	na
Some	40	36.7%	na	na
Always	50	45.9%	na	na
Unknown	16	100%	na	na
Never	11	68.8%	na	na
Some	3	18.8%	na	na
Always	2	12.4%	na	na

Source: see data appendix

Table 8
LONG TERM DEBT AND OTHER FIRM'S CHARACTERISTICS

PART I: SC1 sample

	Mean value of characteristics			Mean values of characteristics		
	Never	Some	Always	Below median	Between median and 3d. quartile	Above 3d. quartile
Maturity (Long term debt/total debt)	0.000	0.165	0.324	0.023	0.179	0.430
Leverage (Total debt/total capital)	0.505	0.603	0.644	0.563	0.616	0.605
Liquid assets/total capital	0.069	0.083	0.067	0.080	0.077	0.062
Clients/total capital	0.236	0.227	0.213	0.254	0.221	0.173
Fixed assets/total capital	0.534	0.540	0.598	0.504	0.559	0.650
Sales (real growth rate)	0.044	0.066	0.067	0.053	0.059	0.078
Operating surplus/capital stock	0.120	0.151	0.152	0.150	0.152	0.120
Investment/Capital stock	0.241	0.226	0.214	0.238	0.212	0.223
Capital stock (millions of 1975 sucres)	1.386	3.027	7.184	2.224	4.479	3.824
Sales (millions of 1975 sucres)	5.486	10.706	18.145	9.571	14.190	8.074

PART II: sc2 sample

	Mean value of characteristics			Mean value of characteristics		
	Never	Some	Always	Below median	Between median and 3d. quartile	Above 3d. quartile
Long term liabilities/total liabilities	00	0.22	0.35	0.04	0.29	0.65
Total liabilities/total assets	0.31	0.54	0.59	0.35	0.64	0.84
Liquid assets/total assets	0.47	0.44	0.43	0.14	0.61	0.85
Profits/total assets	2.212	22.135	62.255	-0.2	0.5	0.14
Total assets (millions of 1975 sucres)	2.212	22.135	62.255	2.457	15.054	120.437

Source: see data appendix

Table 9

ECONOMETRIC ANALYSIS OF DETERMINANTS OF ACCES TO LONG TERM DEBT (SC1 sample)

	PROBIT maximum likelihood	**PROBIT** maximum likelihood random effects	**LOGIT** maximum likelihood	**LOGIT** maximum likelihood fixed effects
AGE2	**0.03**	**0.00**	**0.05**	
	(0.38)	*(0.00)*	*(0.37)*	
AGE3	**-0.04**	**-0.13**	**-0.07**	
	-(0.49)	*-(0.58)*	*-(0.44)*	
AGE4	**-0.13**	**-0.34**	**-0.21**	
	-(1.32)	*-(1.49)*	*-(1.31)*	
BAND	**-0.05**	**-0.01**	**-0.10**	
	-(0.60)	*-(0.04)*	*-(0.67)*	
LASK1	**0.51**	**1.32**	**0.78**	**2.72**
	(1.59)	*(2.41)*	*(1.46)*	*(2.39)*
LEV1	**0.44**	**0.53**	**0.72**	**0.13**
	(6.28)	*(4.73)*	*(6.16)*	*(0.39)*
CFK1	**-0.20**	**-0.46**	**-0.33**	**-0.58**
	-(0.94)	*-(1.19)*	*-(0.93)*	*-(0.60)*
LRKAP1	**0.29**	**0.50**	**0.48**	**0.58**
	(12.99)	*(9.32)*	*(12.56)*	*(1.86)*
RHO		**0.68**		
		(10.47)		
$\chi 2$	314.417	353.626	314.045	
(p-value)	(0.0000)	(0.0000)	(0.0000)	
Nobs	2069	2069	2069	1869
Nfirms	731	731	731	531

Footnote: year and industry dummies included

Table 10

LENGTH OF MATURITY EQUATION (SC1 sample)

	TWO STAGE *HECKIT*(PROBIT SELECTION)	TWO STAGE *HECKIT*(LOGIT SELECTION)
AGE2	**-0.01**	**-0.02**
	(-0.33)	*(-0.94)*
AGE3	**-0.04**	**-0.04**
	(-1.00)	*(-1.65)*
AGE4	**-0.05**	**-0.04**
	(-1.11)	*(-1.56)*
BAND	**-0.01**	**0.01**
	(-0.18)	*(0.46)*
ASS1	**0.29**	**0.30**
	(5.91)	*(8.03)*
LEV1	**0.12**	**0.05**
	(2.07)	*(1.93)*
CFK1	**-0.20**	**-0.19**
	(-2.14)	*(-3.27)*
GYREAL1	**0.29**	**0.03**
	(1.26)	*(1.67)*
LRKAP1	**0.04**	**0.01**
	(1.26)	*(0.43)*
LASK1	**0.28**	**0.27**
	(1.99)	*(3.08)*
LAMBDA	**0.50**	**0.18**
	(2.41)	(3.05)
F-stat	**10.14**	**10.02**
(p-value)	(0.00)	(0.00)
Nobs (positive)	1.140	1140
Nfirms	731	731

Footnote: year and industry dummies included

Table 11

SAMPLE SELECTION MODEL FOR ACCESS TO THE LONG TERM DEBT AND MATURITY EQUATION (SC2 sample)

	PROBIT	TWO STAGE *HECKIT*
AGE2	**-0.13**	**-0.02**
	(-3.57)	*(-1.73)*
AGE3	**-0.01**	**0.04**
	(-0.16)	*(2.54)*
AGE4	**-0.22**	**0.02**
	(-1.83)	*(0.95)*
PROF1	**-2.23**	**-0.82**
	(-6.74)	*(-8.30)*
PROF1*LD	**1.22**	**0.67**
	(3.03)	*(6.10)*
LRTA1	**0.064**	**-0.00**
	(7.89)	*(-1.74)*
LRTA1*LD	**0.24**	**0.00**
	(16.17)	*(0.22)*
LEV1	**0.73**	**0.26**
	(9.52)	*(11.97)*
ASS1		**0.28**
		(14.19)
LAMBDA		**0.40**
		(9.08)
$\chi 2$	**1115.48**	
	(0.00)	
F-stat		**30.77**
(p-value)		(0.00)
Nobs	8060	
Nobs (positive)		6113
Nfirms	731	731

Footnote: year and industry dummies included

Table 12

PRODUCTION FUNCTION (SC1 sample)

Dependent variable: LRY	**GMM** first differences (1)	**GMM** first differences (2)	**GMM** first differences (3)	**GMM** first differences (4)
Constant	**-0.03** *-(3.65)*	**-0.04** *-(4.08)*	**-0.04** *-(4.57)*	**-0.04** *-(2.60)*
LRY1				**0.41** *(3.23)*
LRM	**0.46** *(8.61)*	**0.38** *(6.64)*	**0.39** *(6.96)*	**0.36** *(5.51)*
LRM1				**-0.15** *-(1.98)*
LRK	**0.08** *(2.05)*	**0.05** *(1.00)*	**0.05** *(1.07)*	**0.15** *(2.18)*
LRK1				**-0.11** *-(1.55)*
LRN1				**-0.08** *-(1.75)*
LRN	**0.42** *(6.64)*	**0.45** *(6.24)*	**0.46** *(6.87)*	**0.42** *(3.33)*
MAT	**-0.03** *-(1.16)*	**0.16** *(1.70)*	**0.18** *(2.28)*	**0.35** *(2.04)*
MAT1				**-0.096** *-(1.58)*
LEV		**0.01** *(0.22)*		**0.02** *(0.198)*
LEV1	**-0.005** *-(0.24)*			**-0.001** *-(0.03)*
D87	**-0.03** *-(3.77)*	**-0.03** *-(3.01)*	**-0.03** *-(3.18)*	**-0.016** *-(0.93)*
D88	**-0.05** *-(5.52)*	**-0.04** *-(3.25)*	**-0.04** *-(3.44)*	**-0.024** *-(1.23)*
Wald [df] (p-value)	**206.30[5]** 0.000	**169.66[5]** 0.000	**183.52[4]** 0.000	**172.50[11]** 0.000
Sargan [df] (p-value)	**64.82[31]** 0.000	**56.89[31]** 0.003	**59.20[32]** 0.002	**19.90[25]** 0.752
M1 (p-value)	**-3.543** 0.000	**-2.714** 0.007	**-3.488** 0.000	**-4.642** 0.000
M2 (p-value)	**-1.277** 0.202	**-0.766** 0.444	**-0.761** 0.447	**0.089** 0.929

Table 13
INVESTMENT FUNCTION (SC1 sample)

Dependent variable: IK	GMM first differences (1)	GMM first differences (3)
Constant	**0.02**	**0.02**
	(2.18)	*(1.34)*
IK1S	**0.11**	**0.09**
	(2.25)	*(1.75)*
IK1L	**0.07**	**0.08**
	(1.67)	*(1.52)*
CFKN1S	**0.24**	**0.24**
	(2.37)	*(2.33)*
CFKN1L	**0.14**	**0.17**
	(1.69)	*(1.85)*
GYR1S	**0.04**	**0.03**
	(1.88)	*(1.59)*
GYR1L	**-0.01**	**-0.005**
	-(0.82)	*-(0.23)*
GYRS		**0.05**
		(0.65)
GYRL		**-0.14**
		-(1.55)
MATS		**-0.20**
		-(1.73)
MATL		**0.15**
		(1.58)
MAT1S	**-0.09**	
	-(1.09)	
MAT1L	**0.05**	
	(1.04)	
LEV1S	**-0.0007**	**-0.02**
	-(0.01)	*-(0.34)*
LEV1L	**-0.002**	**0.03**
	-(0.05)	*(0.72)*
D87	**-0.01**	**-0.003**
	-(0.58)	*-(0.156)*
D88	**-0.05**	**-0.035**
	-(3.2)	*-(2.22)*
Wald [df]	**29.40[10]**	**33.48[12]**
(p-value)	0.001	0.001
Sargan [df]	**64.49[50]**	**54.70[48]**
(p-value)	0.082	0.227
M1	**-9.325**	**-8.725**
(p-value)	0.000	0.000
M2	**0.712**	**0.596**
(p-value)	0.477	0.551

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